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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/622,558

07/18/2003

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112056-0099

4806

24267 7590 11/04/2008
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EXAMINER

HUSSAIN, TAUQIR

ART UNIT

PAPER NUMBER

2452

MAIL DATE

DELIVERY MODE

11/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/622,558	Applicant(s) GOLE ET AL.	
	Examiner TAUQIR HUSSAIN	Art Unit 2452	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/01/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action is in response to amendment /reconsideration filed on 10/01/2008, the amendment/reconsideration has been considered. Claims 1-38 are pending for examination, the rejection cited as stated below.

Response to Arguments

2. Applicant's arguments have been fully considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1-2 and 4-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slaughter et al. (Patent No.: US 6014, 669), hereinafter "Slaughter" in view of Chao et al. (Patent No.: US 6438, 705 B1), hereinafter "Chao".

5. As to claims 1 and 10, Slaughter discloses, a first server and a second server, wherein the second server is a cluster partner to the first server (Slaughter, Col.1, lines 17-19, where two nodes are first server and second server); and

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a storage operating system operating on the first server (Slaughter, Col.1, lines 17-19, where since these computers have storage devices and are performing computing task therefore there has to be an operating system installed), the storage operating system including a cluster connection manager configured to create, destroy, and maintain one or more communication sessions with the cluster partner (Slaughter, Col.1, lines 55-60, where concept of maintaining and tracking the changes and updating the node configuration is disclosed, therefore some sort of management module is running on these computers), the cluster connection manager operatively interconnected with a set of cluster connection manager clients (Slaughter, Fig.2, Col.3, lines 51-55, where each node connected to a client), where each client is a process executing on the storage system (Slaughter, Col.3, lines 54-55, where client is a software running on each node).

Slaughter however is silent on disclosing explicitly, wherein the cluster connection manager is further configured to create, destroy, and maintain virtual interface connections between cluster connection manager clients on the first server with a cluster connection manager client on the second server to form a peer process between the cluster connection manager clients.

Chao however discloses the similar concept, wherein the cluster connection manager is further configured to create, destroy, and maintain virtual interface connections between cluster connection manager clients on the first server with a cluster connection manager client on the second server to form a peer process between the cluster connection manager clients (Chao, Fig. 3a-c, Col.3, lines 28-35, where along

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with cluster manager, cluster DLL which helps the node to interact with MCS and update the status of individual resources).

Therefore, it would have been obvious to one of the ordinary skilled in the art at the time the invention was made to combine the teachings of Slaughter with the teachings of Chao in order to provide a popularity of clustering. First, microprocessors are increasingly fast. The faster microprocessors become, the less important massively parallel systems become. It is no longer necessary to use super-computers or aggregations of thousands of microprocessors to achieve suitably fast results.

6. As to claims 2 and 11, Slaughter and Chao discloses the invention substantially as in parent claim 1 above, including, wherein one of the set of communication clients comprises a failover monitor (Chao, Abstract, where failover concept is disclosed).

7. As to claim 4, Slaughter and Chao discloses the invention substantially as in parent claim 1 above, including, wherein the cluster connection manager is further adapted to perform connection management operations in response to communications from the connection manager clients (Slaughter, Col.4, lines 48-53, where nodes leaving or joining the cluster are reconfigured).

8. As to claim 5, Slaughter and Chao discloses the invention substantially as in parent claim 4 above, including, wherein the communications comprise an application program interface function call (Chao, Col.6, lines 10-13, where API functions are disclosed).

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9. As to claim 6 and 12, The Slaughter and Chao discloses the invention substantially as in parent claim 1 above, wherein the cluster connection manager is further adapted to load balance the one or more communication sessions over a plurality of cluster interconnect devices (Chao, abstract, where moving resources between clusters is equivalent to load balancing).

10. As to claim 7 and 13, The Slaughter and Chao discloses the invention substantially as in parent claim 1 above, wherein the cluster connection manager is further adapted to perform a failover procedure for one or more communication sessions from a failed cluster interconnect device to an operational cluster interconnect device (Chao, Abstract, where failover of resources are re allocated between the other operating nodes in the cluster).

11. As to claim 8, The Slaughter and Chao discloses the invention substantially as in parent claim 1 above, wherein the cluster connection manager is operatively interconnected with a plurality of cluster interconnect devices (Slaughter, Fig.1, abstract, where nodes 104A,B,C and D are obviously have plurality of interconnect devices).

12. As to Claim 9, is rejected for same rationale as claim 8 above.

13. Claim 3, are rejected under 35 U.S.C 103(a) as unpatentable over Slaughter and Chao as applied to the parent claims 1 above, in view of Chu et al. (Pub. No.: US 2004/0019821 A1), hereinafter "Chu".

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14. As to claim 3, Slaughter and Chao discloses the invention substantially as in parent claim 1 above.

Slaughter and Chao however are silent on disclosing explicitly, wherein one of the set of cluster connection manager clients comprises a non-volatile random access memory shadowing process.

Chu however discloses wherein one of the set of cluster connection manger clients comprises a non-volatile random access memory shadowing process (Chu, Abstract, where, NVRAM module could be interpret as shadowing process).

Therefore, it would have been obvious to one ordinary skilled in the art at the time the invention was made to combine the teachings of Sutherland and Meyer with the teachings of Chu in order to provide a system and a method for reliable failover involving incomplete redundant arrays of inexpensive disks (RAID) writes in clustering systems (Chu, Abstract).

15. Claims 14-19 and 25-38 are rejected under 35 U.S.C 103(a) as unpatentable over Slaughter, in view of Meyer et al. (Patent No.: Us 7,203,730 B1), hereinafter "Meyer".

16. As to claim 14, 25 and 29, Slaughter discloses, creating, using a cluster connection manager executing on a first server, an initial connection with a cluster partner on a second server (Slaughter, Col.4, lines 29-36, where cluster server106 initializes with other nodes to setup an initial configuration);

exchanging a set of peer connection information (Slaughter, Col.4, lines 29-30, where node membership information includes the connection information);

passing a set of cluster connection manager client information to the cluster partner, wherein the set of cluster connection manager client information includes at least one virtual interface and any memory requirements for each cluster manager client (Slaughter, Col.4, lines 33-36, where database 112 initializes and stores the cluster membership, since server-106 is part of a cluster therefore it is virtually connected with all the nodes via connection module);

creating a set of appropriate communication ports using the set of cluster connection manager client information (Slaughter, Col.7, lines 55-60, where ports are incremented after every reconfiguration);

Slaughter however is silent on disclosing, alerting the cluster partner of a ready status or alerting a set of cluster connection manager clients that the cluster partner is in a ready state.

Meyer however discloses, alerting the cluster partner of a ready status (Meyer, Col.13, lines 17-22 and 28-30, where SCSI device manager performs the readiness status to other services which could be cluster partners); and alerting a set of cluster connection manager clients that the cluster partner is in a ready state (Meyer, Col.13, lines 28-30, where SCSI device manager performs the readiness status let the client know of ready status).

Therefore, it would have been obvious to one ordinary skilled in the art at the time the invention was made to combine the teachings of Sutherland as applied to claim

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1-2 and 4 above with the teachings of Meyer in order to perform functions including discovery, classification, and profiling of storage devices, computer systems, connection elements, and other components relating to a storage area network (SAN).

17. As to claims 31 and 36, Slaughter discloses, waiting for an event from a client communicating with a cluster partner to be received by a cluster connection manager executing on a storage operating system (Slaughter, Col.4, lines 48-53);

determining whether the event is a client event (Slaughter, Col.4, lines 55-60, where crash of a node is a client event); and

in response to determining that the event is a client event, performing the event (Slaughter, Col.4, lines 54-60, where redistributing the configuration is an event).

Slaughter however is silent on disclosing explicitly, the cluster connection manager.

Meyer however discloses, the cluster connection manager (Meyer, Col.2, where SAN management tools are disclosed).

Therefore, it would have been obvious to one ordinary skilled in the art at the time the invention was made to combine the teachings of Sutherland with the teachings of Meyer in order to perform functions including discovery, classification, and profiling of storage devices, computer systems, connection elements, and other components relating to a storage area network (SAN).

18. As to claim 28, carry similar limitations as claim 25 and therefore is rejected under for same rationale.

19. Claims 37 and 38 are rejected under for same rationale as applied to claim 14, 25 and 29 above.

20. As to claim 30 and 32, is rejected under for same rationale as applied to claims 14, 25 and 29 above.

21. As to claim 33, Slaughter and Meyer discloses the invention substantially as in parent claim 32 above, including, wherein the set of communication ports comprises a set of virtual interface connections (Slaughter, Col.3, lines 60-65, where client parameters can contain communication ports and ports can be virtual ports).

22. As to claim 34, Slaughter and Meyer discloses the invention substantially as in parent claim 32 above, including, wherein set of clients comprises a failover monitor (Slaughter, Col.3, lines 27-31, where CMM performs the monitoring function).

23. As to claim 35, Slaughter and Meyer discloses the invention substantially as in parent claim 31 above, including, further comprising monitoring the status of one or more cluster interconnect drivers utilizing the cluster connection manager (Slaughter, Col.3, lines 27-31, where cluster membership monitor CMM monitors the connection and status).

24. As to claim 15 and 26, Slaughter and Meyer discloses the invention substantially as in parent claim 14 above, including, wherein the set of clients comprises a failover monitor process (Slaughter, Abstract, where concept of failover is incorporated).

25. As to claim 16, Slaughter and Meyer discloses the invention substantially as in parent claim 14 above, wherein the set of peer connection information comprises a version number (Slaughter, Col.5, lines 27-30, where version no is taken into consideration).

26. As to claim 17, Slaughter and Meyer discloses the invention substantially as in parent claim 14 above, collecting, from a set of clients, the set of client information (Slaughter, Col.3, lines 60-65, where in client information is collected in the database); and

transferring the collected set of client information to the cluster (Slaughter, Col.3, lines 60-65, where client information is transfer across the cluster).

27. As to claim 18, Slaughter and Meyer discloses the invention substantially as in parent claim 17 above, wherein the client information comprises a number of communication ports required (Slaughter, Col.3, lines 60-65, where client parameters can contain communication ports).

28. As to claim 19, Slaughter and Meyer discloses the invention substantially as in parent claim 17 above, wherein the set of client information further comprises an amount of memory requested by a particular client (Slaughter, Abstract where distributed processing system it is known fact to allocate the memory demanded by client or assigned by the server or management software).

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29. As to claim 27, Slaughter and Meyer discloses the invention substantially as in parent claim 25 above, wherein the event condition is a load-balancing condition (Slaughter, Col.1, lines 16-21, where task distributed among various processors are load balancing).

30. Claims 20-21 are rejected under 35 U.S.C 103(a) as unpatentable over Slaughter and Meyer in as applied to parent claim 14 above in view of Craddock et al. (pub. No.: US 2003/0061296 A1), hereinafter "Craddock".

31. As to claim 20, Slaughter and Meyer disclose the invention substantially as in parent claim 14 above. Slaughter and Meyer however are silent on disclosing explicitly, wherein the step of creating an initial connection further comprises the step of using remote direct memory access primitives to create the initial connection.

Craddock however discloses, wherein the step of creating an initial connection further comprises the step of using remote direct memory access primitives to create the initial connection (Craddock, Abstract, lines 1-6 and [0033, lines 1-3, where message contains primitive).

Therefore, it would have been obvious to one ordinary skilled in the art at the time the invention was made to combine the teachings of Sutherland and Meyer with the teachings of Craddock in order to provide a distributed data processing system for processing storage I/O in a system area network (Craddock, summary of the invention).

32. As to claim 21, Slaughter and Meyer disclose the invention substantially as in parent claim 14 above, including, wherein creating an initial connection further

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comprises the step of performing a series of remote direct memory access operations to create the initial connection (Craddock, [0064, lines 1-7], read operation is performed by RDMA and [0065, lines 1-3], where write operation is performed by RDMA therefore, read and write are series of operations performed by RDMA).

33. Claim 22, is rejected under 35 U.S.C 103(a) as unpatentable over Slaughter and Chao in view of Pinto (Patent No.: US 7,099,337 B2), hereinafter "Pinto".

34. As to claim 22, Slaughter and Chao disclose, the invention substantially as applied to claims 1, 4 and 6-12 above, including, alerting a set of clients of an impending termination of the communication session (Slaughter, Col5, lines 58-62, where because of invalid configuration database cluster server refuse a connection).

Slaughter and Chao however are silent on disclosing explicitly closing, by the clients, a set of communication ports associated with the communication session, wherein the set of communication ports comprise a set of virtual interface connections and performing an initialization of a peer-to-peer communication session procedure.

However, Pinto discloses, closing by the clients, a set of communication ports associated with the communication session, wherein the set of communication ports comprise a set of virtual interface connections (Pinto, Col.11, lines 7-8, where switch configuration means

Closing offline or non-communicative ports); and performing an initialization of a peer-to-peer communication session procedure (Pinto, Col.11, lines 3-7, where subnet 500 will be initialized).

Therefore, it would have been obvious to one ordinary skilled in the art at the time the invention was made to combine the teachings of Slaughter with the teachings of Pinto in order to provide a mechanism at a host node to implement redirection for Class Managers that do not reside on the host node in order to process incoming data messages accordingly in a switched fabric for scalable solutions (Pinto, Abstract).

35. Claims 23-24, are rejected under 35 U.S.C 103(a) as unpatentable over Slaughter and Chao and Pinto in view of Gronke (Pub. No.: US 2002/0071386 A1), hereinafter "Gronke".

36. As to claim 23, Slaughter, Chao and Pinto discloses, the invention substantially as in parent claim 22. Sutherland, Chao and Pinto are silent on wherein the set of communication ports comprises a set of virtual interface connections. However, Gronke discloses, wherein the set of communication ports comprises a set of virtual interface connections (Gronke, Fig.1A, [0020, lines 1-4], where software process communicated using virtual interface).

37. Therefore, it would have been obvious to one ordinary skilled in the art at the time the invention was made to combine the teachings of Slaughter and Pinto with the teachings of Gronke in order to provide automatic failover in a channel-based network. According to an example embodiment, a virtual port to physical port mapper is provided.

38. As to claim 24, Slaughter, Chao, Pinto and Gronke discloses, the invention substantially as in parent claim 22, including, wherein the set of clients comprises a

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failover monitor (Gronke, [0002, lines 7-12, where failover monitor could be an offline node).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAUQIR HUSSAIN whose telephone number is (571)270-1247. The examiner can normally be reached on 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on 571 272 3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/T. H. /
Examiner, Art Unit 2452

/Kenny S Lin/
Primary Examiner, Art Unit 2452